

Applicant : Jürgen-Michael Weick et al.
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Filed : August 1, 2003
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Attorney's Docket No.: 15540-009001 / 25768;
Trumpf: 18.00224; DS07757

Amendments to the Drawings:

The attached replacement sheet of drawings includes changes to Fig. 2 and replaces the original sheet including Fig. 2.

In Figure 2, a reference number "27" for the laser has been added.

Attachments following last page of this Amendment:

Replacement Sheet (1 page)

REMARKS

Claims 1-37 are pending, with claims 16 and 17 being withdrawn, and claims 1, 18, and 30 being independent. Claim 1 has been amended and claims 18-37 have been added. Support for the amendments to claim 1 can be found in the originally-filed specification, at least at page 3, line 24 to page 4, line 21 and in Figs. 1 and 2. Support for the new claims can be found in the originally-filed specification, at least at page 2, line 15 to page 3, line 8. No new matter has been added.

Applicant has amended Fig. 2 to add a reference number for the laser 27 and has amended the specification to reflect this change. No new matter has been added.

35 U.S.C. § 102(b)

Claims 1, 2, and 11 have been rejected as allegedly anticipated by U.S. Patent No. 4,943,161 (Michaelis). Applicants request withdrawal of this rejection because Michaelis does not describe or suggest laser radiation from a laser that is directed onto a workpiece and a means for decoupling diagnostic radiation positioned downstream of the laser and in the path of the laser radiation that is directed to a workpiece, as recited in claim 1.

Independent claim 1 recites a laser-processing machine including a laser that produces laser radiation that is directed to a workpiece, a means for decoupling diagnostic radiation from the laser radiation, a measuring cell into which gas to be analyzed can flow, and a sound detector for detecting a photo-acoustical effect due to absorption of the diagnostic radiation by gas in the cell. The means for decoupling diagnostic radiation is positioned downstream of the laser and in the path of the laser radiation that is directed to the workpiece. The measuring cell is positioned downstream of the means for decoupling diagnostic radiation to receive the decoupled diagnostic radiation.

Michaelis' laser beam 26 is directed from a laser 16 into a measuring chamber 14, which includes a microphone 19 to detect an acoustic signal generated by an interaction of the laser beam 26 and a gas in the measuring chamber 14. See Michaelis at col. 4, lines 40-67, and at Fig. 1. Michaelis also describes splitting off a portion of the laser beam 26 away from the measuring

chamber 14 and toward a detector 17' that is used for normalizing the system. See Michaelis at col. 4, lines 60-63, and at Fig. 1. However, no portion of Michaelis' laser beam 26 is directed to a workpiece, and the beam splitter 18 is not positioned in the path of laser radiation that is directed to the workpiece.

Moreover, it would not have been obvious to modify Michaelis to obtain the subject matter of claim 1. Michaelis' laser beam 26 is used to measure hydrocarbons. There is nothing in Michaelis that would suggest directing the laser beam 26 onto a workpiece.

For at least these reasons, claim 1 is allowable over Michaelis. Claims 2 and 11 depend from claim 1 and are allowable for at least the reasons that claim 1 is allowable.

35 U.S.C. § 103(a)

Claims 3-8 have been rejected as allegedly obvious over Michaelis. As discussed above, claim 1 is allowable because Michaelis does not describe or suggest all of the limitations of claim 1 and it would not have been obvious to modify Michaelis to obtain the subject matter of claim 1. Applicants request withdrawal of this rejection because claims 3-8 depend from claim 1, and therefore are allowable for at least the reasons that claim 1 is allowable.

Claims 9 and 10 have been rejected as allegedly obvious over Michaelis in view of U.S. Patent No. 5,811,753 (Weick). Claims 9 and 10 depend from claim 1, which was rejected as being anticipated by Michaelis. Weick does not remedy the deficiencies of Michaelis to describe or suggest the subject matter of claim 1.

Weick relates to a laser machine tool that includes a laser beam generator 3, a machining head 4, and a beam passage 25 between the laser beam generator 3 and the machining head 4. See Weick at abstract and Fig. 1. However, Weick never describes decoupling diagnostic radiation from the laser radiation generated by the laser beam generator 3. Moreover, it would not have been obvious to modify Michaelis using the laser machine tool of Weick because any such modification would change the principle of operation of Michaelis, which, as described above, is the use of a laser beam to measure hydrocarbons. Thus, because Weick fails to remedy the deficiencies of Michaelis, and because one of ordinary skill in the art would not have been motivated to modify Michaelis using the laser machine tool of Weick, claim 1 is allowable over

any possible combination of Weick and Michaelis. Claims 9 and 10 are allowable for at least the reasons that claim 1 is allowable.

Claims 1-14 have been rejected as allegedly obvious over Weicke in view of Michaelis. Applicants request withdrawal of this rejection because neither Weicke nor Michaelis, alone or in combination, describes or suggests all of the elements of independent claim 1, and because one of ordinary skill in the art would not have been motivated to modify Michaelis using the laser machine tool of Weick, as discussed above. For at least these reasons, claim 1 is allowable over any possible combination of Weicke and Michaelis. Claims 2-14 depend from claim 1 and are allowable for at least the reasons that claim 1 is allowable.

Claim 15

Applicants request clarification regarding the status of pending claim 15. While the Examiner indicated in the Office Action Summary that claim 15 is rejected, the Examiner failed to list claim 15 in the recitation of the claims at Page 2 of the Office Action.

New Claims 18-37

Independent claim 18 recites a method for monitoring gases. The method includes processing a workpiece including directing laser radiation onto the workpiece, flowing gas to be analyzed into a measuring cell, decoupling diagnostic radiation from the laser radiation and directing the diagnostic radiation into the measuring cell, and detecting a photo-acoustic effect due to absorption of the diagnostic radiation by the gas in the measuring cell.

Neither Weicke nor Michaelis describes or suggests directing laser radiation onto a workpiece, decoupling diagnostic radiation from the laser radiation, and directing that diagnostic radiation into a measuring cell, as recited in claim 18. For at least these reasons, claim 18 is in condition for allowance. Claims 19-29 depend from claim 18, and are allowable for at least the reasons that claim 18 is allowable.

Independent claim 30 recites a diagnostic machine including a radiation decoupler positioned downstream of a laser and in the path of laser radiation that is directed to a workpiece such that at least a portion of the radiation is decoupled from the path of the laser radiation at the radiation decoupler and the decoupled radiation is directed along a new path. The diagnostic

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machine includes a measuring cell into which gas to be analyzed flows, and a sound detector positioned relative to the measuring cell. The measuring cell is positioned downstream of the radiation decoupler to receive the decoupled radiation. The sound detector is configured to detect a photo-acoustical effect due to absorption of the decoupled radiation by gas in the measuring cell..

Neither Weicke nor Michaelis describes or suggests a radiation decoupler positioned downstream of a laser and being in the path of laser radiation that is directed to a workpiece, as recited in claim 30. For at least these reasons, claim 30 is in condition for allowance. Claims 31-37 depend from claim 30, and are allowable for at least the reasons that claim 30 is allowable.

Applicant submits that all claims are in condition for allowance.

Enclosed is a check for excess claim fees in the amount of \$850.00 and a Petition for Two Months Extension of Time with a check for \$450.00 for the required fee. Please apply any other charges or credits to deposit account 06-1050, referring Attorney Docket No. 15540-009001.

Respectfully submitted,

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